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FARMERS' ATTITUDES TOWARDS THE ADOPTION OF SUSTAINABLE AGRICULTURAL PRACTICES (LITERATURE ANALYSIS)

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Abstract
Increasing farmer acceptance and adoption of environmentally friendly agricultural practices is essential to mitigate the negative impacts of agriculture. However, farmers are not a homogeneous group, and their behavior is subject to a complex set of structural, socio-economic, and socio-psychological influences.
Human behavior is one of the driving forces for successful agribusiness management. However, it can be the basis of many resource management problems at the same time and is often the component that is not given enough attention when developing management plans. Moreover, the implementation of agricultural strategies relies on the individual behavior.
Individual behavior is based on a variety of social, psychological, institutional, and economic factors that must be understood for successful implementation of farm management strategies.
This paper reviews a highly specialized literature in the area of farmers' attitudes and intentions to adopt pro-environmental behavior. The aim of this paper is to analyze the application of some of the social psychology theories in the area of adoption of sustainable agricultural practices and to summarize the factors that influence farmers' attitudes towards adoption. This in turn would help to better understand the agricultural unit and the agricultural sector as a whole.
The report examines qualitative and quantitative summaries of highly specialized literature studies published in scientific databases such as Ebsco, Science Direct and others. The literature summarizes analyses over the last few decades of farmers' attitudes and intentions towards adopting pro-environmental behaviors, and the factors by which they are influenced.
In order to fulfill its objective, the report is based on two main points, which are discussed in detail separately, namely „Theoretical approaches and models for adopting sustainable agricultural practices“, and „Factors influencing attitudes towards the adoption of sustainable agricultural practices“.
Key words: attitudes, sustainable agricultural practices, conservation practices, pro-environmental behavior, farming
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Environmental pollution as a result of human activity has been one of the main topics of discussion over the last few decades. Among the global challenges in this area is the simultaneous improvement of food security and minimisation of envi-

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ronmental impacts caused by agricultural production systems. Given this, it is important that farmers adopt innovative practices that increase productivity and reduce environmental damage (Guerin T.F., 2001; Delaroche M., 2020; Foguesatto C., 2020).

Farmers are often encouraged to change their farming practices to more sustainable ones in the hope that this will mitigate the negative impacts of their activities on soil, water, greenhouse gas emissions and biodiversity. The adoption of sustainable agricultural practices (SAPs), also known as a set of conservation practices (CPs) (Hobbs P.R., 2007), has emerged as an important alternative in meeting these challenges. CoPs are integral to maintaining the long-term viability of agroecological systems. They typically refer to production and management practices of the farm unit, and are often presented as a solution to the impacts of intensive farming systems. SFM includes activities that integrate ecological, societal and economic dimensions (Zeweld W., 2017). According to the Food and Agriculture Organization of the United Nations (FAO, 1989), SFM includes five main components: 1. Resource conservation; 2. Environmental protection; 3. technical feasibility; 4. economic relevance; and 5. social acceptability. It is important to mention that CPs are differentiated according to the purpose for which they are applied (soil, water, etc.) and the type of benefit they provide (on-farm or off-farm) (Delaroche M., 2020; Foguesatto C., 2020; Lu J., 2022).

Despite the need to take adequate action to address environmental problems, CPs are rarely implemented by farmers. This is most likely driven by the fact that they are not a homogeneous group and their behavior is subject to a complex set of structural, socio-economic and sociopsychological influences (Leonhardt H., 2021).

Governments and public agencies in developed countries set up agri-environment schemes (AES) to subsidize farmers who voluntarily adopt CS – practices also promoted by the private sector through certification schemes through which farmers receive monetary compensation in the form of a price premium for their product in exchange for implementing sustainable practices. In Europe, AECs are seen as a key policy measure to address the negative impacts of agriculture on the natural environment (see Ronchi S., 2019; Zimmermann A., Britz W., 2016). In order to increase the uptake of AES, research on farmers' motivation and behavior is essential. Therefore, understanding and/or adherence to AES requires taking into account both the structural and socio-economic aspects of the farm as well as the farmer's sociopsychological factors (see Dessart F.J., 2019; Lovejoy S.B.,Napier T.L., 1986). Typologies, archetypes, or so-called farming styles are useful tools for understanding the motivations that provoke the adoption of sustainable farming practices. Each style can be defined as a multifaceted concept that captures a particular combination of factors and contributes to a better understanding of farmer behavior. In terms of agriculture, factors may encompass individual practices, size, intensity, marketing of produce, relationship to the environment, etc. (Doichinova Y.,

(2008)). The farmers styles found in previous studies include, but are not limited to: 1. business oriented and environmentally focused; 2. production-minded; 3. tradition-focused and family farming; 4. disengaged; 5. independence-focused type; 6. farm-as-hobby type; and 7. A combination of different types (see Davies B.B., Hodge I.D.,2007; Emtage N., 2006; Guillem E.E., 2012; Walder P., Kantelhardt J., 2018; McGuire J.M., 2015; O'Rourke E., 2012; Hammes V., 2016; Maybery D., 2005). This multiplicity of types is highly dependent on both time and space (van der Ploeg, 1992; Fairweather J.R., Klonsky K., 2009; Leonhardt H., 2021).

Yet, given the short-term nature of some AECs (e.g. 5-10 years) and the risk of losing political and financial support, call into question their ability to fundamentally change farmers' values and attitudes and sustain pro-environmental behavior in the long term. In addition, changes in already established farming practices are often seen as a risk by the individual farmer (Delaroche M., 2020; Lu J., 2022).

One thing is for sure, human behavior is crucial for successful agribusiness management. It is one of the driving forces, but at the same time it can be the basis of many resource management problems, and is often the component that is not given enough attention when developing management plans (Floress K., 2015). It is no coincidence that the implementation of strategies that rely on individual behavior change raise the question: what needs to be done to encourage farmers to adopt long term sustainable farming practices (Delaroche M., 2020; Floress K., 2015).

The aim of this paper is to review and analyse the application of some of the theories of social psychology in the field of implementing sustainable agricultural practices, summarising the factors influencing farmers' attitudes towards adoption.

The report examines qualitative and quantitative summaries of highly specialised literature studies published in scientific databases such as Ebsco, Science Direct and others. The literature summarises analyses over the last few decades of farmers' attitudes and intentions towards adopting pro-environmental behaviors, and the factors by which they are influenced.

Theoretical approaches and models for adopting sustainable agricultural practices

The main influence on farm policy, culture and activities is the farmer. Decision-making takes place at the individual level, and the attitudes of the farmer, who performs the position of a managerial figure, determine the development of the agricultural unit.

Fundamental findings related to attitudes toward performing certain behaviors are represented in theories developed in the 1950s-1960s. A number of researchers assumed the existence of a relationship between an individual's intention and the actual performance of his or her behavior. Ajzen I., (1985) in the Theory of Planned Behavior (TPB), for example, examined the relationship between an individual's attitudes and his or her actions. TPP defines attitude towards a particular behavior

as „the degree to which the performance of the behavior is evaluated positively or negatively". After more than twenty years of application and refinement, TPP has been established as one of the most important contemporary approaches for studying individuals' decision making (Yuzhanin S., Fisher D., 2016). It has been widely used in the environmental sciences to explain, predict, and promote environmentally friendly (proenvironmental) behaviors (Klöckner C.A., 2013; Foguesatto C., 2020). In addition, a behavior can be studied through a single action or a set of actions (Ajzen I., 2001; Cooper J., 2015; (8) Expected utility theory (EOT) (Jara-Rojas R., 2012; Kassie M., 2013-2015) assumes that the decision maker chooses between risky or uncertain prospects by comparing their expected utility values in order to maximize that utility. In other words, TO suggests that people make decisions based on the expected change in their level of welfare (Edwards-Jones G., 2006; Foguesatto C., 2020).

The benefits associated with adopting CP have been identified as a driver of conservation behavior (Ranjan P., 2019). According to the Theory of Collective Action (TCA), for example, farmers' adoption of practices that primarily provide off-farm benefits may be indicative of their ecological type of farming identity, associated with higher levels of environmental concern and perceived collective efficacy (Luther Z.R., 2020), (Pradhananga A.K., Davenport M.A., 2017; Ostrom E., 2007).

The Diffusion of Innovations (DI) theory (Rogers E.M., 1995) supports the findings that the presence of ecological self consciousness, positive attitudes and specific knowledge towards certain programmes and/or practices, and previous or current experience of related or unrelated CPs influence continuity. TRI states that awareness of the innovation, knowledge of it and understanding of how it works are important precursors for an individual to form an attitude towards it, which can lead to behaviors of acceptance or rejection of the innovation itself. It should also be borne in mind that the role of institutions is central to the impact and maintenance of behavior change towards natural resources (Ostrom E., 2007; Heberlein T.A., 2012).

Factors influencing attitudes towards the adoption of sustainable agricultural practices

A large number of empirical studies have focused on understanding the factors and analysing which of them influence, positively or negatively, the adoption of SLM. Based on the literature review, factors can be categorized into: farmer characteristics; farm characteristics; financial/management; exogenous; psychological; economic; categories of CSA; information; and environmental awareness (Foguesatto C., 2020; Lu J., 2022).

The group of factors characterizing the farmer includes the personal characteristics of the farm decision maker and his household. Factors include: age, level of education, ethnicity, experience, family, gender, health, economically inactive household

members, and presence/absence of skills. Among these factors, age can have a positive or negative influence on the uptake of SSA. On the positive side, older farmers often have more experience, which may influence their propensity to adopt a new practice (Amsalu A., Graaff J., 2007). Similarly, for younger farmers, where there is a long-term planning perspective, the uptake of SLM is positively influenced (Amsalu A., Graaff J., 2007). In his study, Anley Y., (2007) found that educational level has a positive influence on adoption of SFM. Higher level of profiled education is positively associated with the adoption of CPs that provide both on-farm and offfarm benefits (Lu J., 2022). The size of the farmer's family and of the firm, taking into account the amount of labour, also has an impact (Amsalu A., Graaff J., 2007; Kassie M., 2013). In addition, the positive health status of the farmer can influence the adoption of CSA in direct proportion (Jin J., 2015; Foguesatto C., 2020).

The group of general farm characteristics mainly refers to the geographical characteristics of the farmland and the physical and chemical characteristics of the soil, including: distance to the administrative office of the farm; to the district centre; to the main market, to the main residence; position and condition of the plot; soil type, colour, quality, depth and fertility, erosive power. Among geographic characteristics, some studies have shown that distance is a factor influencing the adoption of SLM. Shorter distances would help farmers to have better access to information (Kassie M., 2013-2015), which positively affects adoption of CSA. Conversely increasing transport costs and travel time, longer distances can have a negative impact. Soil physical and chemical characteristics, soil type and soil fertility deserve special attention as they are determinants of agricultural production (Kassie M., 2013). Farmers reporting low fertility levels and increased erosion are more likely to adopt SFM (Tesfaye A., 2014; Foguesatto C., 2020).

Financial and management variables include financial characteristics (i.e., method of obtaining income and farm assets) and production management. Among these factors, farm size can be considered as a measure of economic condition (Tey Y.S., Brindal M., 2012) and positively influences the perception of CSA (Amsalu A., Graaff J., 2007). In addition, other factors such as ownership of assets (machinery, tools, land) are considered as a proxy for economic status in the context of adoption of CSA. It is expected that a farmer with more financial support has a greater capacity to adopt new farming practices. The literature analysis shows that there is a relationship between land tenure and the implementation of SLM. For example, farmers who work on their own properties are more likely to adopt CSA (Kassie M., 2013; Kpadonou R.A.B., 2017). Off-farm income can also affect continuity. Additional income unrelated to farmland may provide additional resources for continuity or, conversely, reduce the priority of farm work, lowering interest in adopting certain practices (Knowler D., 2007; Foguesatto C., 2020).

In terms of farm management, a key categorization of CPs is whether they are operational or structural in nature. This, in turn, determines the frequency of management decisions, i.e., whether they are characterised by their temporary or permanent nature, and hence influences the level of costs associated with them. Operational practices have an annual implementation cycle and may result in moderate recurring annual costs, whereas structural practices may result in large initial adoption costs (Rogers E.M., 1995). For example, a larger farm size could prompt farmers to try a new practice on a small plot in advance before fully adopting it, thus encouraging trial (Rogers E.M., 1995; Lu J., 2022).

The group of exogenous factors mainly refers to climate issues and farmers' relationships with external agents on the farm. The increasing frequency and severity of extreme weather events leading to climate change have the potential to cause serious damage to agricultural production. Assessing these losses and engaging in climate change adaptation trainings are positively associated with the adoption of SFM (Zhang L.,2018; Kpadonou R.A.B.,2017). Farmers who belong to different associations, maintain good community relations, etc., can be positively influenced in adopting CSA (Foguesatto C., 2020).

Driven by the idea of adopting innovations and innovative concepts, and exploring the process of their implementation, TRI also highlights the importance of several factors or conditions that are assumed to be motivators and indicators of conservation behavior: higher income, profiled education, larger farm scale, presence of a „vulnerable“ plot (eroded and/or with pronounced slopes) (Ranjan P.,2019), and farmers' propensity to seek and use information. Therefore, using a targeted approach that directs technical and financial resources to the most vulnerable land, but also ensures that farmers have autonomy in the targeting process, can be useful in promoting pro-environmental-conservation behavior (Arbuckle J.,2013; Ranjan P.,2020a). The importance of having domain-specific knowledge highlights the need for professionals to target their knowledge and efforts to innovators in a particular community, as well as those who have not yet adopted CPs or have adopted minimal ones (Lu et al.,2021; Ranjan P.,2020 b; Lu J.,2022). Prokopy has found that increased diversity in the agricultural portfolio can be positively associated with multiple social, economic, and environmental benefits (Prokopy L.S., 2020). Last but not least, the effectiveness of CP in providing both private and public benefits is an important consideration for adopting attitudes towards a pa type of behavior (Lu J.,2022).

The psychological factors that influence pro-environmental behavior boil down to concern for the quality of agricultural products; farmer's general concern; habits; satisfaction with farm labor; values; and risk avoidance (Lu J., 2022).

Farmers' pro-environmental decision-making is motivated to varying degrees by the characteristics of the CP. Literature analyses made it clear that farmers' propensity to seek and use information, the size and vulnerability of their land, and higher

levels of income and education were major factors predicting attitudes towards conservation behavior. The quantitative and qualitative studies analyzed showed that while attitudes toward new sustainable practices and programs are important for both actual adoption and intention toward it, behaviors such as previous or current adoption of other CPs, as well as farm characteristics as a business unit are more definitive in predicting actual adoption. In addition, land ownership is essential for pro-environmental decision making. Farmers who are in sole possession of their land are often expected to be better at conserving natural resources and adopting CP (Caswell M., 2001; Soule M.J., 2000; Ranjan P., 2019). However, it is found that the presence of such a property asset predetermines attitudes towards the uptake of KP, and due to other factors that affect the actual continuity (Lu J., 2022).

Many scholars who study conservation behavior pay increasing but limited attention to the practice itself. For example, recent research has focused on understanding adoption of CP as part of a farming system in which farmers adopt combinations of practices (Rudnick J., 2021). Others focus on perceiving CPs as synergistic and ancillary effects or grouping them into separate categories (Lu J., 2022).

It is not only the factors that influence the actual uptake of SSPs that are the subject of research in the literature, but those that influence the intention to uptake them. Analyses reveal some differences between them. Positive attitudes toward the environment and/or toward such a program/practice, higher levels of education, and information seeking and use are positively associated with both intention and actual adoption (Lu J., 2022). Additional factors were also found to be individually significant for each category. For example, the percentage of land owned, is highly associated only with the intention to adopt UPA (Lu J., 2022).

It is important to note that the intention to adopt a particular CP, as a result of a positive attitude towards it, does not necessarily lead to its implementation. Several factors – cost, farm characteristics, lack of information/technology/equipment, (un)availability of cost share, status quo bias, weather variability, market price fluctuations, etc. can hinder actual adoption. The final findings suggest that farmers who have successfully overcome barriers to adoption as a result of previous or ongoing adoption of other CPs are more likely to adopt a particular CP. Various farm characteristics were found to be positively associated with actual uptake but not with intention to uptake. For example, larger farm size and/or amount of arable area may be indicative and encourage experimentation with CP. Similarly, the type of crop grown may have an impact (Rogers E.M., 1995).

Environmental behavior is also influenced by financial factors. Analysis of the literature showed that, from a practical perspective, it is likely that on-farm personal finance is the primary driver of continuity, while off-farm benefits are the secondary driver. Lu J., (2022) found that higher levels of income predicted the adoption of CPs that primarily provided offfarm benefits.

The estimates that are unique to each category of factors, including farmer and farm characteristics; financial/management; exogenous; psychological; economic; SLM categories; information and environmental awareness shed some light on the underlying motivations that drive farmers to engage in conservation behavior. As a result of this synergy, the farmer can experience self-efficacy in achieving benefits both on and off the farm (Floress K., 2015).

The literature review revealed that there is a wide variety of theories describing the implementation of sustainable agricultural practices and a number of factors that may influence farmers' attitudes towards adoption. Exploring different factors and uncovering the relationships between variables can lead to the description of patterns of behavior under certain conditions, which in turn will assist in better understanding the farming unit and the sector as a whole.

From the point of view of the agricultural sector in Bulgaria, there is limited research of this type, which gives rise to the need for future studies. Analyses in the field would contribute to the enrichment of already existing and/or the development of completely new programs and/or policies related to the sustainable management of agriculture in Bulgaria, on the one hand, and the pursuit of the development of pro-environmental behavior – the bridge to environmental sustainability, on the other.

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